DOCUMENT RESUME

ED 476 642 SE 067 958

AUTHOR	Rule, Audrey C., Ed.; Kagan, Jennifer, Ed.
TITLE	Poetry for Teaching Elementary Mathematics Topics.
PUB DATE	2003-00-00
NOTE	66p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01/PC03 Plus Postage.
DESCRIPTORS	Elementary Education; Higher Education; *Integrated Curriculum; Interdisciplinary Approach; *Literature; *Mathematics Education; *Poetry; *Preservice Teacher Education

ABSTRACT

Sixty poems focusing on elementary mathematics topics such as matching, classification, sequencing, counting, addition, subtraction, place value, decimals, multiplication, division, fractions, estimation, probability, patterns, shapes, symmetry, triangles, circles, polygons, angles, Venn diagrams, bar graphs, money, time, and measurement, are presented in this document. Poems display a variety of formats including acrostic, haiku, limerick, and rhyming verse. Each contains mathematical facts about the topic. Preservice teachers enrolled in a mathematics education course wrote the majority of poems. Poems may be used in a enrich elementary student learning and as models for other preservice teachers who may use poetry writing to review, make connections, and discover concept for which they have unclear understandings. Preservice teachers who wrote poetry in the first editor's class reported that the experience helped them develop more positive feelings about mathematics. (Author)

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Audrey C. Rule and Jennifer Kagan, Editors

State University of New York at Oswego

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Introduction

Using Poetry in Mathematics

Too many students today express negative feelings toward mathematics. These students frequently find mathematics abstract, demanding, and lacking in creativity. Mathematics and poetry are often characterized as being at opposite ends of the spectrum: mathematics being so logical, precise, stone-cold, and impersonal, and poetry being imaginative, emotional, and artistic. To make mathematics more personal and interesting, why not include poetry?

Poetry is a form of communication. Writing math poetry provides the opportunity for students to review math concepts, to examine relationships between concepts, and to explain how they work. Students may use examples, metaphors or analogies to help explain abstract ideas. Finding a way to eloquently express these thoughts in rhythm, rhyme, measured syllables, or with specific initial consonants is a complex problem. All of these activities support the idea of mathematics as problem solving, reasoning, and communication (Standard 5 of the Professional Standards for Teaching Mathematics of the National Council of Teachers of Mathematics, 1991). Experience with poetry in mathematics class also provides the opportunity to develop positive attitudes toward mathematics, to explore human emotions, and to develop sensitivity and respect for the feelings of others.

The Origin of the Poetry in this Document

Most of the poems presented here were written by preservice teachers enrolled in a mathematics education course at the State University of New York at Oswego called *Teaching Mathematics: Authentic Literacy and Learning*. Students wrote poems about elementary mathematics topics as a course assignment and voluntarily submitted them to their instructor, Dr. Audrey Rule, for inclusion in this document. This poetry writing assignment was very successful. Students reported to the instructor that they reviewed material as they wrote their poems, made new connections, and discovered

math concept areas of which they were unsure and subsequently learned additional information. They also mentioned that their attitudes toward mathematics improved through this activity because they had not previously thought of mathematics as being "poetic" or related to aesthetics, humor, or positive feelings.

Suggestions for Using this Document

These poems can be used during a mathematics unit for elementary students. Students will enjoy comparing and contrasting different poems on the same topic. Students can list the math facts described in each poem. They may be inspired to write poetry of their own about their favorite math activities.

College instructors of preservice teachers may also use this document as a resource. These poems can be examples for preservice teachers to follow as they construct their own poems.

Reference: National Council of Teachers of Mathematics (1991). *Professional Standards for Teaching Mathematics*. Reston, VA: National Council of Teachers of Mathematics.

Matching

Tracy Warner

Matching's an early thinking skill,
It lays a foundation that surely will,
Help in reading different letters,
Or identifying numbers, even better!

Matching builds kids' problem solving;
Critical thinking is evolving.
Discriminating between different and same -
Colors, shapes, or patterns - the game.

Start out with identical things,
Like blocks, animals, or colored-bead strings.
Then advance to unlike in one way,
As small to large, or colored to gray.

Match the parent to its child:
Glossy colt to stallion wild.
Match realistic to cartoon:
Feathered duck to Looney Tune.

Count the objects in a loop;
Place a numeral with this group.
Whoever thought matching one with one,
Would be an activity filled with fun?

Math Facts:

- Matching is an early thinking skill.
- Without these foundational skills, such as matching, a student cannot move on to higher level thinking skills.
- Students first learn to match identical items then learn to match items that are the same except for one characteristic.

Matching

Tammy Griffin

Matching a color of the same hue,
Is really not that hard to do.
When matching you must try to find,
Another object of exactly that kind.

Placing objects side by side,
Will help you notice and decide.
Examine pattern, color, or size;
Feel the texture; look with your eyes.

Two matched objects might be exactly alike;
Or parts of the objects may be the same type.
As when two rubber ducks look the same,
Or a blue and a red truck come from the same game.

The greatest thing about matching to me,
Is there are so many possibilities!
You can learn something new each day,
When you match objects in a unique way.

Math Facts:

- Matching is a foundational math skill.
- Students learn visual discrimination skills when they practice matching.
- Comparing objects side-by-side helps students to discriminate differences.
- Students first practice matching identical items.
- Teachers can make many types of matching activities for their students.

Matching

Brad DePoint

Matching is easy.
Just put the same together.
It can be fun, too!

So many things match.
Watch me find what's identical:
Plastic animals.

Matching involves skills:
Looking, discriminating,
Comparison, too!

Make similar pairs,
And you will be successful.
Just remember, class...

Follow carefully,
Directions are important.
Thinking brings success.

Math Facts:

- Matching involves recognition of likenesses and differences.
- In matching, students form pairs of identical objects.
- Listening and following directions are important foundational skills.

Sorting Beads

Yvonne Doyle

Find the red beads and put them in a pile,
Then find the green ones, this may take a while.
If there are any yellow, put them in a line,
Gather the blue ones, you are doing fine.
Sorting is fun when you match the beads by color.
Finish this attribute, and then sort by another.
Find all the speckled beads that sparkle and shine,
Then find smooth beads, a favorite of mine.
Don't forget the square beads, the round ones, too.
Sorting is fun when you know what to do.

Math Facts:

- Classification skills are foundational math skills.
- The same set of objects can be sorted in different ways.
- Sorting activities help students discriminate likenesses and differences.
- Objects generally have many attributes such as size, color, pattern, and texture.

Unifix Cubes

Tammy Randall

Useful manipulative in numeration;

Numbers represented for operation.

Individual cubes allow color selection;

Fit together in one direction.

Inequalities shown concretely,

e**X**cellent material. Works so neatly!

Compare patterns, different or same.

Units for non-standard measurement game.

Bars of ten-trains with single car ones,

Equal two-digit number-forming fun!

Math Facts:

- Unifix cubes are plastic cubes in many colors that interlock in one direction.
- These manipulatives can be used for counting, operations, measurement, patterns, and games.
- Bars made of ten cubes are called trains.
- Trains can be used with single cubes to represent two-digit numbers.

Sequence

Lisa Cointot

A sequence is fun.
Arrange the events in time.
Put them in order.

Reverse happenings:
Find end, middle, beginning.
Going backwards now.

Change and repetition.
Look. Recognize the sequence.
List it. What comes next???

Math Facts:

- Forming a sequence is a foundational math skill.
- A sequence is a meaningful arrangement of events in time.
- Math sequence skills relate to reading: each story has a beginning, middle, and end.
- Reversing a sequence requires the additional important skills of thinking backwards.

Dr. Maria Montessori's Math

Lisa Rogers

She wanted children to be free,
And achieve all that they could be:
Montessori's philosophy.

At first, the math was clearly shown,
Then children practiced on their own.
Manipulatives were the stepping-stone.

The children learned to count to ten,
With concrete materials used again.
They understood the numbers then.

When demonstrating addition to us,
She says "together with" rather than "plus."
Understanding's frequently enhanced thus.

Circle, triangle, and square,
Tracing metal insets there:
Beautiful materials children share.

Static addition is at the start,
Then learn the challenging dynamic part,
With regrouping at its heart.

Real life models were the key:
A glass bell to hear, crystal goblet to see.
Using five senses set children free.

Math Facts:

- Maria Montessori was the first woman in Italy to become a medical doctor.
- Her first "Children's House" was created in the slums of Rome for children of poverty and was the beginning of Montessori Education, which has spread worldwide.
- Children in Montessori schools learn to use and care for fragile items, such as glass and crystal, as part of the "Practical Life" curriculum.
- Metal insets are traced to learn basic geometric shapes and fine motor skills.
- Montessori mathematics exercises involve hands-on materials.
- In Montessori addition, the terms "together with" are used instead of "plus" to give children a better idea of the operation involved.

My Ten Fingers

Nicole Ciallelo

I have 10 fingers:
1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
If I didn't have 10 fingers,
I would count my toes then!
I use them to add and subtract any amount.
I need my ten fingers to figure math out!

Math Facts:

- Our number system is base ten- based on ten- because we have ten fingers on our hands.
- The word "manipulative" contains a Latin root word that means hand. People first used their hands for counting and similarly, children use their fingers for counting.
- The hands can be used for adding sums larger than ten by using the method of "counting on".

Seven

Lisa Trabold

You can make seven from four plus three.
You always get seven from that recipe.
You can make seven from two plus five.
And the answer of seven will still arrive!

I like to play with seven,
Sometimes he runs and hides,
Once I spied a fourteen,
With two sevens inside!

Seven lives between six and eight,
Never too early, never too late.
No one can take his place in line,
And seven times seven is forty-nine!

Math Facts:

- Many different pairs of addends can be found that sum to the same number.
- Number sense is the ability to think of different ways to represent the same number.
- Seven is a factor of many numbers.

Counting by Tens

Melissa Van Slyke

Create a series of counting by tens.

One ten, two tens, three tens, then.

U. S. has exactly fifty states.

Now tens help us enumerate.

Ten is our system's base:

Its place is left of the ones space.

Never ending set of numbers:

Good way to count off to slumber.

Bead bars with ten beads make amounts.

You have ten fingers and toes to count.

Ten years is always a decade long.

Even numbers are the set to which tens belong.

November and September each have thirty days.

Start noticing tens in interesting ways!

Math Facts:

- The numbers said when counting by tens, "10, 20, 30, 40, 50..." form a series.
- Our number system is based on ten.
- Many important items in our daily lives involve tens: fifty states in the union, thirty days in several months.
- A decade consists of ten years.

Addition Tradition

Wendy M. Smith

The Mayans used to add in their own special way.
Egyptians used hieroglyphics for accounting display.
Babylonians had wedge-shaped marks for addition play.
While Roman addition depended on how the numerals lay,
But the Hindu-Arabic system is the one we choose today.

An addend plus an addend is always equal to the sum.
Either arrangement of addends is where it's from.
Do *counting on* with your fingers: Make a fist, then raise your thumb.
As you count the second addend, the answer soon will come
When you see the required fingers, your last word is the sum.

When addition is static, no **exchanges** take place,
For multi-digit addition, it's the simplest case.
If you want a challenge, then **regrouping** you must face
Dynamic addition **trades** ten ones from their space,
Renaming them a ten to put in the tens place.

You can add on your body, using finger and toe,
Usually twenty is the highest, this addition can go.
Manipulatives are great, most math students know
Base ten blocks, colored counters, all help to show
And number lines can track sums as they grow.

Math Facts:

- Many ancient peoples developed systems for counting and adding.
- An addend plus an addend equals a sum.
- Addition is commutative.
- Counting on can be used for addition.
- There are several different terms for exchange that occurs in dynamic addition: trading, regrouping, renaming, exchanging.
- No exchanges take place in static addition.
- Base ten blocks, colored counters, fingers and toes, and number lines can be used to solve addition problems.

Static Addition

Carol Lynn Freemantle

I'm always ecstatic,
When problems are static,
There's no regrouping done.
It's easy addition,
No need for revision,
'Cause addend and addend are sum.

Take some from the one's place,
Add more in the same space,
Then move on over to tens.
We don't have to "carry,"
I just feel so merry,
Just add the two digits: the end!

Math Facts:

- Static addition does not involve regrouping. Therefore, it is taught first because it is a simpler concept than dynamic addition.
- The parts to be added are called addends.
- The answer in an addition problem is called the sum.

Addition Acrostic

Lisa Cointot

All hundred facts can be shown in a table,

Diagonal answers, count by two's to be able.

Doubles-near: solve 4+5 by 4+4 plus one more;

Identity is plus zero; it's the same number as before.

Transposing order of addends is Commutative Property.

If it's plus one, the next number solves it properly.

Operation can be "together with," "plus," or "add";

Now you know learning addition facts isn't all-bad.

Math Facts:

- The addition facts are best learned by strategies, rather than memorization. This poem highlights many strategies.
- Plus zero is the same number.
- Plus one is the next number.
- Students may only have to learn about half of the addition facts if they are aware of how to use the Commutative Property of Addition.
- Sums of the addition doubles may be found by counting by twos.
- Sums of "near-doubles" can be found by identifying a true double in the equation and adding or subtracting one.

Addition Acrostic

Kelli Griffin

Addends are numbers we want to combine.

Do this with manipulatives or a number line.

Define the sum: it's the answer we display.

In reality, addition's counting in a fast way.

Two parts are combined to make a whole,

Inverse is subtraction, with opposite goal.

Only two numbers at a time makes a binary operation.

Numbers of 100 facts are 0 -9 combinations.

Math Facts:

- The parts of an addition equation are addend, addend, and sum.
- Addition is a binary operation, which means that only two numbers may be added at one time.
- The inverse operation of addition is subtraction.
- Addition is really a rapid method of counting.
- Students are usually asked to learn 100 addition facts.

Addition Acrostic

Heather Hoffman

Addition is a rapid way to count.

Different addends can sum to the same amount.

Dynamic addition has regrouping or renaming.

Information about the answer comes from estimating.

The result, called the sum, is addition's goal.

In addition, you combine two parts to get a whole.

Odd numbers added in pairs equal an even hero.

Number remains the same if you add zero.

Math Facts:

- Estimation can help students determine if their sums are reasonable.
- The operation of addition involves combining two parts to produce a whole.
- Static addition does not involve regrouping, but dynamic addition does.

Addition

Kerrie Kasarda

Addition is binary, when addends form a line,
Only two numbers can be added at a time:
Like three plus five plus one is eight plus one combined.

Using counters or fingers makes counting fast.
The sum is the answer, and it comes last.
When you use manipulatives, addition's a blast!

Addition is commutative, therefore it doesn't mind,
When addends are switched, they merge just fine.
Four plus five or five plus four both equal nine!

Math Facts:

- In column addition, only two numbers may be added at one time because addition is a binary operation.
- Manipulatives such as one's fingers or counters, help make the operation of addition concrete.
- The Commutative Property of Addition states that the order of the addends does not affect the sum.

Addition Tradition

Denise Warchol

When your teacher asks,
"What's two plus two?"
You may shrug your shoulders,
And feel kind of blue.

"Addition is easy!"
She says with a laugh,
As easy, I think . . .
As a crocodile's bath!

My teacher smiles and whispers,
"Please listen very close,
Addition can be fun.
You may like it the most!"

The numbers to be added,
Like three plus three,
Are called the addends,
Soon you will see.

Six is three together with three,
If it's done right,
Results are called sums,
Practice, and you'll see the light.

A rapid method of counting,
Is all that it is,
Two numbers at a time:
You'll exclaim "Gee whiz!"

In Montessori addition,
You do not say "plus"
"Together with" is the term,
It's not such a fuss.

Two parts are combined,
Which results in the whole.
Addition can be fun!
Understanding is the goal.

Learning to add,
A variety of ways,
Counting with beads, rods, counters or fingers.
You can even count days!

The "addition tradition,"
Has lived a long time.
Here it is explained for you,
In verse and in rhyme!

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Addition

Ashley Gorham

Adding numbers is fun you'll see,
For example, two plus one equals three.

The addends above are two and one,
When added together they equal the sum.

It's combining two parts to make a whole,
The two numbers play an important role.

The order of the addends can be rearranged
But the answer always remains unchanged.

When adding zero, the number's the same.
That's why "identity number" is its name!

Math Facts:

- An "identity number" in addition is a number that can be added without changing the sum. The identity number of addition is zero.
- Addition has the Commutative Property which means that the order of the addends can be changed and the sum will remain the same.
- The operation of addition involves combining two parts to make a whole.

Dynamic Addition

Doreen Bergman

Twenty-seven plus four,
Is complicated to do.
For regrouping is needed,
When you add more than two.

If you add all the units,
And the value's greater than nine,
The next step in addition,
Is a little harder to define.

The trick was to "carry,"
Back when I was in school,
Trading and exchanging,
Are new names for this tool.

Regroup ten ones for a ten,
Place that ten with the other tens,
Count the ones left behind,
You can solve the problem then.

The more that you practice,
The more equations you do,
The better you'll get,
Your mistakes will be few!

Math Facts:

- Dynamic addition is so-named because it involves a change. That change is regrouping of digits in one place to form a digit or digits in the next place.
- There are several current names for the change in dynamic addition: regrouping, renaming, exchanging, and trading. "Carrying" is an obsolete name.
- To become proficient in mathematics, one must practice regularly.

Subtraction

Tara Fedele

First comes the minuend,
Then comes the subtrahend.
We work on subtraction problems,
And learn how to solve them.

Start with a whole, and take part away,
What's left is the "difference", we say.
Subtraction is more than removing a share,
Sometimes with two numbers, it's used to compare.

If you've collected some but want the whole set,
Completion determines how many to get.
If you know the total, and one part at the start,
You can use subtraction to figure out the other part.

Now, our subtraction poem is done,
Grab your manipulatives and run.
You may be stunned,
At how math is so much fun!

Math Facts:

- The terms in a subtraction problem are: minuend, subtrahend, and difference.
- There are four different story problem situations in which subtraction is used: take away, completion, comparison, and whole-part-part.
- Using manipulatives makes subtraction more concrete.

Subtraction with Apples

Nichole Jones

I had ten apples. Sue took two.
That left me with eight. What to do?
"Subtraction," she said, "is what we played."
She took part away, but part still stayed.
Difference is the answer's name,
The **minuend** was what started this game.
The two she took was the **subtrahend.**
Now let's add them back again.
If we play the game in reverse,
Subtraction is replaced by its inverse.
Add the eight to two to find,
Ten original apples of mine.

Math Facts:

- The inverse of subtraction is addition.
- The terms in a subtraction equation are: minuend, subtrahend, and difference.
- Subtraction is best introduced with real objects in an authentic story situation.

The Amazing Number Game

Sarah Szczech

This Amazing Number Game is very useful, as you'll see.
After playing just one round, an enriched person's what you'll be.
To begin let's all take twelve cards and then place them upside down.
On each underside, well hidden, a single digit can be found.
Now each player takes a board with blank addition problem places,
Choose a card for each addend's hundreds', tens', and units' spaces.
The object of this game is to produce the largest sum.
Having an equation with the biggest answer is just how the game is won.
Digits from the cards are carefully placed upon the board.
Watching place value principles will help increase your score.
Once you place a digit, you can't move it - you are stuck.
So be sure to make wise choices, and above all, wish for luck.
Just remember that the one's place is always on the right,
Don't waste high cards at this position if you want game-playing might.
Put the small digits here, if you want the best outcome,
Digits like 0, 1, 2, or 3 here, won't detract from a giant sum.
It is second from the right side that you'll find the tens place.
Placing large digits here can also add to your disgrace.
Middle numbers are the best here: like a six or five or four.
They will help you strategize now and increase your final score.
Third from the right is where hundreds place does remain.
Placing a seven, eight or a nine-card will help you to gain.
Now you understand place value and our work is almost done.
Choose your cards and place them wisely, soon you'll see the game is won.

Math Facts

- This poem describes a number game played with twelve one-digit tiles and a blank addition board with spaces for two three-digit addends for each of two players. Players take turns drawing and placing numeral tiles, each trying to get the largest sum.
- A problem-solving game like this allows students to practice many mental math addition problems of their own choosing as they determine the best position for each tile. This is called problem-posing.

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Number Line

Yvonne Doyle

This is a number line; it's amazing what it can do.
It can help you with your math, if you really want it to.
From the left side to the right, the numbers will increase;
With an arrow at the end, the numbers never cease.
To add two numbers use a finger to carefully track your place.
Five plus one? Just start on five and move ahead one space.
Seven plus four? That's not hard. Start this time at seven.
Count ahead the four lone jumps, landing on eleven.
Subtraction's as easy as moving left. Watch this now, you'll see.
Start on eight, then jump back five, ending up on three.
You can solve so many problems on the number line.
Just remember: forward and back. Then you'll do just fine.
It would take another poem to list all that it can do.
Just work with it and you'll have fun at the same time, too!

Math Facts:

- A number line can be used as an effective strategy for addition or subtraction.
- A number line shows the counting numbers in order.
- To add, move ahead on the number line; to subtract, move backwards.

Place Value

Karleen Kirch

Put digits in order according to worth:

List ones, tens, hundreds, increasing girth.

All the values are read left to right,

Counting with place value is always quite,

Easy, once you know the rules.

Values increase by powers of ten.

Always use zero as a placeholder, then,

Large numbers have families separated by commas,

Units, thousands, millions, billions- the drama!

Everyone who saves "and" for decimal point is cool!

Math Facts:

- Place values increase from right to left, but numbers are read left to right with largest places first.
- Place value families: units, thousands, millions, billions.
- Each family has ones, ten, hundreds.
- Commas are used to separate each family from adjacent families.
- Zero is used as a placeholder.
- Don't say "and" for commas, save "and" for the decimal point.

Million Haiku

By Audrey C. Rule

A thousand thousands,
Six zeros behind a one.
More than I can count.

So many people,
USA population;
Almost three hundred!

The third family,
After thousands and units:
One, ten, and hundred millions.

Commas separate,
Millions, thousands, and units.
Clarify numbers.

A million seconds,
Eleven and a half days
Could you count that long?

Math Facts:

- A million has six zeros.
- A million is a thousand thousands.
- A million is a very large number.
- Commas are used to separate the millions family from the thousands family and the units family.
- Each family has a one, tens, and hundreds place.
- The US population is measured in millions and has at last census 283 million people.
- A million seconds equals eleven and a half days.

Decimals Acrostic

Janelle Cronk

Decimal points separate whole numbers from parts with a dot.

Even whole numbers are decimals with decimal point or not.

Comparing decimals is easy - line up the decimal points and places.

It's like comparing whole numbers; start with highest valued spaces.

Match the numbers until you find one has a digit that's exceeding.

"**A**nd" is what you say for the decimal point when reading.

Left is where you start to read a number less than one:

Say the number as if whole, then the last place value and you're done.

Math Facts:

- Whole numbers can be considered decimal numbers.
- The part of a decimal number that is less than one lies to the right of the decimal point.
- When reading a decimal number, start with the whole number part, then say "and" for the decimal point. Finally, read the decimal part as if it were a whole number and conclude by saying the place name of the decimal place farthest to the right.
- To compare two decimal numbers, line up the decimal points and places. Start at the left and compare digits until you find one that is larger. That is then the larger number.

Decimals

Lindsey Anson

Decimals are numbers expressed with a point:
The whole and the part are tied by this joint.
When reading a decimal, the whole is first said,
Next comes "and", then the small part is read.
In the decimal system, each place is a power of ten,
Positive powers for the wholes; negatives for those less than.
Scientific notation easily expresses very great and small,
Eliminating most zeros and using powers of ten to write all.

Math Facts:

- Each decimal place can be expressed as a power of ten. The ones place is 10^0, the tens place is 10^1, the hundreds place is 10^2, and the one thousands place is 10^3. Similarly, the places representing numbers less than one can be shown with powers of ten. The tenths place is 10^{-1}, the hundredths place is 10^{-2}, and the one-thousandths place is 10^{-3}.
- The powers of ten for whole numbers are positive.
- The powers of ten for numbers that are smaller than one are negative.

Decimals

Sarah Szczech

Although we usually begin,
By counting with one,
Don't forget smaller numbers,
That have long before begun.

For all these numbers,
"Decimal" is the name.
They're parts of a whole,
That's their claim to fame.

To name specific decimals,
Know the names of their places.
Start to the right of the decimal point,
Identify the spaces.

The very first place,
To the right of the dot,
Is the tenths place,
Just one digit in this spot.

When there are two digits,
the tenths and another,
Then read the two-digits and,
end by saying "hundredths."

Three digits to the right of the dot,
Require the next decimal place.
Call the number "thousandths,"
When this is the case.

To read any decimal number,
Isn't a very tough task,
Just read it like a whole number,
And the rightmost digit's place last.

Let's Multiply

Sharlene Loomis

Let's multiply two facts together.
It's easy to do.
It's a special case of addition,
For smart students like you.

Let's multiply two factors
Such as six and four,
It's multiplicand times multiplier,
With product twenty-four.

Let's multiply together,
With many different tools:
Unifix cubes, base ten blocks,
Manipulatives are cool!

Let's multiply together,
With commutative property,
The order of the factors,
Doesn't change the answer for me.

Let's multiply together,
Zero times anything.
It's easy to remember,
The product is always nothing.

Math Facts:

- Multiplication may be viewed as a special case of addition in which all the addends are the same.
- The Commutative Property of Multiplication states that the order of the factors does not matter.
- Any number multiplied by zero is the same number.

The Multiplication Squares

Kari Sovas

One times one equals one.
Isn't this easy and fun?

Four is made by two times two,
Wait, there are many more to do!

Three times three will give you nine.
You can quote me on that line!

Make sixteen with four times four.
Don't worry, only a few more.

Five times five is twenty-five.
That answer's easy to contrive.

Thirty-six is six time six.
I hope this info really sticks.

Seven times seven is forty-nine.
I told you multiplication's fine!

Sixty-four is eight times eight.
Wow, I'm impressed, your skills are great!

Nine times nine is eighty-one,
Don't worry, we are almost done.

One hundred results from ten times ten.
Our square facts have come to an end!

Math Fact:

A square of a number is formed by multiplying the number by itself.

The Teacher Who Found Beauty in Multiplying

Derek Warren

John just loved to multiply;
With teaching math, he was satisfied.
Concrete materials he collected,
Real objects for kids he never neglected.
He showed cross product combinations,
Using the objects for his presentations.

John described multiplication as a function:
Produce a third with two numbers' junction.
It's a special case of addition where,
The addends are all the same there.
His students smiled, 'cause they understood,
Making John pleased that his teaching was good!

Math Facts:

- There are many different ways to view multiplication.
- A cross product is a set of combinations produced by pairing each member of one set with each member of another.
- Multiplication may be viewed as a function.
- Multiplication can be viewed as a special case of addition in which all the addends are the same.

Division

Lindsey Anson

Division is multiplication's inverse,
When comparing difficulty, division is worse.

Hard to teach, hard to understand;
Manipulatives help students learn first-hand.

Multiplication and subtraction all in a blend;
For problems with quotient, divisor, and dividend.

Guess the quotients as the problem proceeds,
Many supporting skills are what a student needs.

Lay the foundation by dividing real stuff,
Start out concrete, 'cause division is tough.

Math Facts:

- Multiplication and division are inverse operations.
- The names of terms in a division problem are dividend, divisor, and quotient.
- Division is a difficult operation to learn because it requires many supporting skills.

The Opposite of Multiplication is the Rule

Wendy M. Smith

The components of division,
Shared a little house.
Dividend on the inside,
Divisor on the out.

The quotient always somehow,
Ends up on the roof.
Listen to this story,
You'll enjoy my little spoof.

Divisor, Divisor,
Was knocking at the door.
Dividend said,
"You can't enter anymore!"

"Every time you do,
You make me scream and shout.
You split me into equal parts,
With a remainder lying about."

"I understand the opposite,
Of multiplication is the rule.
But I don't care, I wonder how
You could be so cruel!"

Math Facts:

- Division and multiplication are opposite operations.
- The terms in division are: dividend, divisor, and quotient.

Division

Sharlene Loomis

Division is great if you know what to do,
Six divided by three is equal to two.

Division is hard if you cannot see,
Multiplying is the inverse: two times three.

Six is the answer, as we stated before.
If you still don't get it, practice some more.

Division is made of divisor and dividend,
The quotient is the answer that comes at the end.

Division can be easy when viewed as subtraction,
Takes away the divisor, then repeat the action.

Division has two types of problem situations,
Partition and measurement involve different relations.

Math Facts:

- Division may be viewed as repeated subtraction when all the subtrahends are the same number.
- There are two types of division problem situations: partition and measurement.
- In partition, you know the number of sets, but not how many are in each set.
- In measurement, you are trying to find out the number of sets, when the number in each set is known.

Division

Janelle Cronk

The dividend in division, is the amount to be divided.
The number of recipients, the divisor, is decided.
The quotient is the answer; it's what one person gets.
Take all the colored counters and divide them into sets.

Sometimes, although you started with all the numbers whole,
There are a few left over after each divisor gets its dole.
This is the remainder and it makes division hard,
"Cause students expect whole numbers - it catches them off-guard!

Math Facts:

- Division is a difficult operation for many reasons.
- One reason division is difficult is because the answer (quotient) may or may not be a whole number. In every other operation (addition, subtraction, multiplication) if you start with two whole numbers, the answer will be a whole number. This is not always true in division.

Divide it in Half

Kari Sovas

We'll start with one whole,
Let's get ready to roll!
Cut in half, the pizza with cheese.

I ate one large slice,
But a friend begged, be nice,
And share the remainder with me.

One fourth we each get,
She eats hers and yet,
Before I can take a small bite...

She says, share again.
After all, I'm your friend,
And the meal I just had was too light.

Now we each have eighths,
Thin slices on our plates,
So before she can stop me, it's gone.

So how much did each get?
Counting eighths is the best bet.
Convert them all, then, add on.

Four eighths in a half,
And one eighth was the last,
So I had 5/8 I called, "My."

Two eighths are a fourth,
Then she ate one eighth more,
So 3/8 was her share of the pie.

Fractions Acrostic

Melanie Payne

Fraction strips help students compare different portions.

Reciprocals of fractions are upside-down contortions.

Addition, multiplication, division, and subtraction,

Convert mixed numbers to improper fractions.

Top number tells the number of pieces, but,

Inspect the bottom number to tell how many were cut.

Ordering fractions from largest to small,

Needs a common denominator for them all.

Simplify fractions and they're easier to recall.

Math Facts:

- The top number of a fraction is called the numerator.
- The bottom number of a fraction is called a denominator.
- The numerator tells how many pieces are being considered.
- The denominator tells how many pieces the whole was divided into.
- A mixed number is a whole number with a fraction.
- An improper fraction has a numerator larger than its denominator.

Fractions Acrostic

Jennifer Sanborn

Fractions as operators is a meaning of fractions.

Rename fractions to assist in math transactions.

A whole number with a fraction can be called mixed,

Concrete materials allow misunderstandings to be fixed.

The denominator can't be zero, as it approaches infinity.

Improper fractions are greater than one but retain validity.

One whole results when numerator and denominator are the same.

Numeration requires converting to percent or decimal name.

Students learn fractions well with a problem-solving game.

Math Facts:

- Students learn fractions best by actually using manipulatives and cutting objects into fractional parts.
- When the numerator and denominator are the same, the fraction represents one whole.
- Fractions may be expressed as decimals or percents.

Estimating is Fun!

Kate Lloyd

Estimating numbers can be lots of fun.
Round off to the hundreds place, or tens, or ones.
Approximations can produce an answer quick;
Compatible numbers make the operations click.
A number four or less will shrink far down in size,
While a number five or larger is then maximized.
Estimate before you solve or wait 'til the end?
Always at the start, for good results depend,
On knowing the range in which the answer lies;
An error won't be able to take you by surprise.
Estimation helps you check and find mistakes,
Use it and you'll value the short time it takes!

Math Facts:

- Estimation yields compatible numbers that make computations easier.
- In rounding, if a digit is less than five, it is rounded down.
- In rounding, if a digit is five or greater, it is rounded up.
- Estimation is performed before solving the problem.
- Estimation gives a general idea of what the answer should be and helps to identify errors.

Probability

Sarah Szczech

All around us,
It's quite easy to see,
That our lives are filled.
With probability.

Each time you flip a coin,
Or happen to roll a die,
How can you best guess,
On which side it will lie?

If probability seems,
Like a confusing blur,
Remember it's the chance,
An event will occur.

When looking at a die,
With six different faces,
There exist six possible outcomes,
Or six different cases.

Any one of these cases,
Can be the one that is shown.
You won't know which one results,
Until the die is thrown.

Six possible answers,
Can result from one die.
Making an equal chance for each side,
One in every six, it will lie.

Probability isn't difficult,
Quite soon you'll realize
It's just using fractions,
But they're in disguise.

Patterns Acrostic

Brandi Reader

Paper and cloth have duplicated dots and lines.

A person's routine may follow a daily design.

Tessellations are geometric patterns that completely cover a plane,

Tap, nod, stomp is kinesthetic; repeat this over and over again.

Enunciation patterns include Southern drawl.

Repetition of a unit is the key to them all.

Nine times products have digits that always sum to nine.

Sort objects by size or color, then alternate them in a line.

Math Facts:

- Patterns can be seen in so many different places: cloth, people's routines, geometric tiles, speech patterns, and mathematics.
- Repetition is the key to all patterns. A pattern is a sequence that repeats.
- The product of a number multiplied by nine shows this pattern: the sum of its digits is nine.

Patterns Acrostic

Angela Gonzales

Problem-solving strategy uses data to predict,

A B A B A guides the next one to be picked.

The finding of regularities or traits that repeat;

There are so many different patterns that are neat.

Early thinking skills in stringing beads or laying tiles,

Repetition of shapes or colors by rules brings smiles.

Numbers can be used to make a pattern. That is true.

Sequences that repeat like 3.33 are patterns too.

Math Facts:

- Discovering and continuing a pattern is a good problem-solving strategy.
- The ABA form is an example of a pattern.
- Patterns are repetitions according to rules; sequences that repeat.
- Patterning is taught early with manipulatives such as beads and tiles.
- Numbers that repeat in some way also form patterns.

Patterns Acrostic

Katie Edick

Puns are based on surprising patterns,

Art has motifs that mirror, slide and turn.

The need to discriminate must be heeded.

These thinking skills in many areas are needed.

Every pattern has a unit that repeats.

Regularity is the criterion it meets.

Notice patterns in your actions every day.

Sound health patterns affect you in a good way.

Math Facts:

- Patterns can occur in surprising places. Puns are based upon unexpected patterns between words or phrases.
- Forming a pattern is an early math skill that lays the foundation for recognition of more complex patterns later.
- Every pattern has a unit that repeats.

Patterns Acrostic

Tara Bryant

Picture and bar graphs may reveal,

A survey's trend of how classmates feel.

Time has sequences that repeat:

The months of each year and the days of each week.

Engaging activities for pattern-finding:

Repetition recognition- just keep reminding.

Numbers, colors, symbols, and shapes,

Stickers, stencils, and stamps do patterns make.

Math Facts:

- Graphs can visually reveal patterns that might be otherwise difficult to detect in the data.
- Our system f tracking time forms a repeating pattern of hours, days, and months.
- Students can use many different items to form patterns: numbers, symbols, shapes, stickers, stencils, and stamps.

Three Kinds of Symmetry

By Audrey C. Rule

Repetition.
Bilateral, folded,
Mirroring, Flipping, Reflecting,
Left matches right perfectly.
Line-symmetry.

Duplication.
Pinwheel-like, Axisymmetric,
Rotating, turning, swirling,
Motifs surround an axis.
Rotational-symmetry.

Replication.
Identical, equi-spaced,
Repeating, copying, sliding,
Duplicate in a line.
Translation-symmetry.

Math Facts:

- There are three kinds of symmetry.
- Line or mirror symmetry is like folding or flipping.
- Many organisms are bilateral and have mirror symmetry.
- A line of symmetry divides left and right.
- Rotational symmetry involves repetition around an axis.
- Translational symmetry is sliding symmetry where motifs are equally spaced along a line.

SHAPE SONG

Carolyn House

Two sides short and two sides long:
I love to sing this great Shape Song.
One curved edge. Four sides the same.
See if you can guess my name.

I have sides, and corners three,
You can count along with me.
One, two, three and three, two, one,
I make a boat sail when I'm done.
What am I? Triangle!

I go round and round you see,
Getting dizzy as can be.
I bounce, I spin, and I can roll,
The shape of me is like a hole.
What am I? Circle!

My ends are shorter than my sides,
I am much longer than I'm wide.
My sides are four; I have no more,
But I've four corners like a door.
What am I? Rectangle!

When you count my sides you'll find,
They're the same size all the time.
You see four corners and four sides,
I make a box where you can hide.
What am I? Square!

If you're smart, then you will know,
All the names before we go.
Triangle, Circle, Rectangle, Square,
You can see shapes everywhere!

Math facts:

1. A triangle has three sides and three corners.
2. A square has four sides and four corners, all the same.
3. A rectangle has four corners and two long side and two short sides.
4. A circle has one continuous curving edge.
5. Some objects are clearly identified by their shape.

The Triangles Limerick

Rebekah Williams

Let me tell you about **triangles:**
Polygons with three sides and three angles.
Each one's not the same,
Listen well as I name,
Or the terms will all twist into tangles.

Equilateral's same sides are a treasure,
Congruent angles just add to the pleasure,
Scalene's sides don't agree,
On the lengths they should be,
But **Isosceles** has two of same measure.

Those with a ninety-degree angle are **Right.**
Acute's smaller angles seem slight,
When compared to **Obtuse,**
With one angle too loose,
But for all, area's half base times height.

Math Facts:

- Triangles are three-sided polygons.
- There are two ways to classify triangles, by sides or by angles.
- Equilateral triangles have equal sides and equal angles.
- Isosceles triangles have two equal sides.
- Scalene triangles have no sides congruent.
- A right triangle has one ninety-degree angle.
- An acute triangles has three angles that are each less than ninety degrees.
- An obtuse triangle has one angle greater than ninety degrees.
- The area of a triangle is one-half the base times the height.

Triangle Haiku

Wanda Kenny

Three straight lines take shape.
Triangle is polygon.
Sides meet at vertex.

Three angles on each.
Add the angles for degrees:
One hundred eighty.

Math Facts:

- Triangles are polygons with three sides and three angles.
- The lines of a triangle meet at points; each point is called a vertex.
- An angle is created at each vertex.
- The three angles measurements sum to 180 degrees.

Triangles Acrostic

Tricia Hughes

Triangles have one hundred-eighty degrees;

Right triangles have an angle with ninety of these.

In all, the largest angle's opposite the longest side,

And every triangle can have a circle circumscribed.

Name a triangle by its three vertices,

Geometry is the subject where you'll work with these.

Legs are sides that aren't the hypotenuse,

Each side is less than the sum of the other two.

See? Triangles can be fun for you, too!

Math Facts:

- The angles in a triangle sum to 180 degrees.
- Right triangles have one right angle.
- The longest side is opposite the largest angle.
- Triangles are named by their vertices.
- The sides of a right triangle that are not the hypotenuse are called legs.
- Geometry is the mathematics area in which triangles are studied.
- The measurement of each side of a triangle is always less than the sum of the other two sides.

Triangles Acrostic

Kristen Backus

Theorem of Greek Pythagoras:

Right triangles' legs squared and summed thus,

Is the same as the square, of hypotenuse there.

Area equals half the base times the height.

Now remember, a 90 degree angle is right.

Geometry is possible with triangle proofs.

Larger than 90, but less than 180 is obtuse.

Equilateral triangles have all side lengths the same.

Similar triangles will have the same name.

Math Facts:

- The Pythagorean Theorem states that the sum of the squares of the two legs of a right triangle is equal to the sum of the square of the hypotenuse.
- Angles that are larger than ninety degrees, but less than 180 degrees, are called obtuse.
- Similar triangles will have the same angles and proportions, but may not be the same size. They will, however, have the same name.

Angles

Krystal Smith

Angles are *awesome*:
Two rays that share the same point.
Measured in degrees.

Most common is **RIGHT**,
From perpendicular lines.
"Square" can be its name.

Next comes the ACUTE.
It's less than ninety degrees.
A small wedge of pie.

Biggest of them all:
This is the OBTUSE angle.
Greater than ninety.

Math includes angles.
Angles are used everyday.
Let's try and find some!

Math Facts:

- Angles are classified by degree measurements.
- Acute angles measure less than ninety degrees.
- Right angles are exactly ninety degrees.
- Obtuse angles measure between ninety and one-hundred eighty degrees.

The Circle Limerick

By Audrey C. Rule

A circle is smooth all around;
A curve that continues so round.
Each point on the rim's
Same distance from within,
And by the circumference is bound.

Cross through the center to find,
Diameter's the name of this line.
But a much smaller part,
From edge to center heart,
Is how radius is defined.

The circumference measure will be,
Close to diameter times three.
This number is Pi,
Three point one four one five,
Works for ev'ry circle you'll see.

Math Facts:

- A circle is a curved figure.
- Points on the circle are equidistant from the center.
- The diameter is a line that goes through the center.
- The radius extends from center to edge.
- The circumference is pi times the diameter.
- Pi is 3.1415

Polygon Limerick

Paul Bennettt

There once was a man from Oregon,
Who lived in a four-sided polygon.
They called his home square:
Four right angles were there.
He put on an addition to make an octagon.

His octagon was made out of pine,
It looked just like a stop sign.
Eight sides seemed like heaven
'Cause a heptagon has only seven,
And his house had an extra line.

His neighbors were exceedingly jealous
They demanded, "Mr. Octagon, tell us,
Why four sides won't do."
Said Octagon, "It's true,
For spacious polygons, I am so zealous!"

Math Facts:

- Squares, octagons, and heptagons are polygons.
- Squares have four right angles.
- An octagon has eight sides and is the same shape as a stop sign.
- A heptagon has seven sides.

Prisms Acrostic

Lindsey Anson

Polyhedra with parallelogram sides around an axis arranged,

Remaining sides are polygons for which the figure's named.

Infinitely many types that enclose 3-D spaces.

Simple closed polygon surfaces are called faces.

May be a right prism or may be oblique.

Studied since the time of the ancient Greeks!

Math Facts:

- A prism is a polyhedron with parallelogram faces arranged around an axis and polygons at the ends.
- A prism is named for its pinacoidal polygon faces.
- The ancient Greeks studied and advanced geometry.

Venn Diagrams Acrostic

Trisha Wall

Visual aid teachers often select;

Each circle of the diagram encloses a set.

Not limited to any one school subject,

Note overlapping areas have criteria to be met.

Describes how members are different and the same.

Intersecting circles provide areas bounded by a frame,

And a title gives the diagram an identifying name.

Graphic organizer that makes a great recorder,

Reasoning skills are used for placing things in order,

And a label on each set helps define the border.

Middle area contains items with shared traits,

Start using them today 'cause Venn Diagrams are great!

Math Facts:

- Venn diagrams are graphic organizers composed of overlapping circles.
- Venn diagrams and the sets portrayed should be labeled.
- Each circle encloses a set.
- Areas of overlap must conform to characteristics of all overlapping circles.
- The circles in a Venn diagram intersect and overlapping areas must have characteristics of all sets of which they are part.

Venn Diagrams

Elizabeth Murphy

A teacher explained a Venn diagram:
"It's easy, my student, my little lamb.
Your lessons begin,
As we examine,
This wonderful chart!" exclaimed the M'am.

Some circles that are intersecting,
Produce diagrams that you've been neglecting.
The name of them's Venn.
Use them now and again,
'Cause they're certainly well worth respecting.

Each circle encloses its own set,
Overlapping domains will always get,
Items that share,
Characteristics from where,
Extend the original circlets.

Venn diagrams help you to reason.
Sorting objects is certainly pleasin'.
Label each category,
With traits satisfactory,
And through placements you'll be a breezin'!

Opposites don't work well for labels,
Like "frozen" and "warm" are unstable:
Most objects are not,
Both cold and red-hot.
To find joint members, one won't be able.

Bar Graphs Acrostic

Kelly Morris

B Both axes each need an accurate label.

A Aids generalizing from a data table.

R Rectangular strips are recognizable.

G Graphic, highly visual technique.

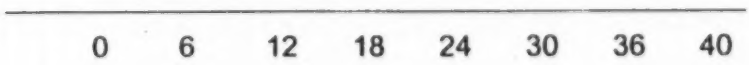
R Relationships highlighted as unique.

A Accurate way to hypothesize.

P Proportional connection to bar size.

H Horizontal or vertical bar positions.

S Show comparisons, explain conditions.



Math Facts:

- Bar graphs are graphic organizers that display data visually.
- The lengths of the bars indicate magnitude of some variable.
- The axes of bar graphs should be labeled.
- One can make inferences about the data and see trends on a bar graph.

What Are Coins Worth?

Kari Sovas

Which coin is only worth one cent?
A copper penny, so easily spent.

To buy some five-cent gum to chew,
A round silver nickel's what I'd use.

Tenth of a dollar, spent in no time,
Smallest of all, this coin is a dime.

A silvery quarter, large and round,
Worth twenty-five cents - I have found.

Coin names and values to comprehend,
'Cause money's so much fun to spend!

Math Facts:

- A copper penny is worth one cent.
- A nickel is worth five cents.
- A dime is worth ten cents.
- A quarter is worth twenty-five cents.

Time

Caroline Blewett

Telling time is easy,
If you know the rules.
The little hand tells the hour,
Moved by gears and precious jewels.

The big hand ticks off minutes,
As around the face it travels.
From twelve to twelve, it takes a while,
For sixty minutes to unravel.

Fifteen minutes is a quarter,
'Cause it's a fourth the way around.
Thirty minutes is a half,
When the minute hand points straight down.

When the minute hand reaches nine,
It's "a quarter to," we say,
Or "forty-five minutes after,"
You can state it either way.

Twelve hours for the AM day;
Twelve more for PM night.
Make twenty-four for every date,
Twice around the clock - that's right.

Yesterday, today, tomorrow,
Twenty-four hours in each day.
Time does not stand still.
Be sure to take time to play.

Once time is gone,
Then, it's gone for good.
Get it back? You can't, my friend.
Though I wish I could.

Math Facts:

- An analog clock has two hands that indicate the hours and minutes. The short hand tells hours; the long hand shows minutes.
- Time on the quarter hour is shown by the minute hand. A quarter after occurs when the minute hand points to the three; thirty minutes after occurs when the minute hand points to six; a quarter to occurs when the minute hand reaches nine.
- There are twenty-four hours in a day, therefore, the hour hand moves around the clock twice each day.

Ruler

Yvonne Doyle

I'm a ruler, did you know?
I can measure rain and snow.
I can measure houses in feet,
I'm the handiest tool you'll meet!
A foot ruler has twelve inches in a row.
Have you ever shoveled that much snow?
A yardstick's exactly three feet long;
Shoveling those drifts would make you strong!
Inches are used in a weather station gauge,
That collects precipitation every day.
So when snow or rain begins to fall,
Take a ruler out and measure it all!

Math Facts:

- A foot long ruler measures twelve inches.
- A yardstick measures 36 inches or three feet.
- A gauge measures precipitation at a weather station.

SE067958

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Signature: Audrey C Rule	Printed Name/Position/Title: Audrey C. Rule, Prof. Associate
Organization/Address: Dept. Curriculum & Instruction, Poucher Hall State University of New York at Oswego Oswego, NY 13126	Telephone: 315-312-2929 FAX: 315-312-5446 E-Mail Address: arule@oswego.edu Date: 06-06-03

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